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EXAMINER	
GUILL, RUSSELL L	
ART UNIT	**PAPER NUMBER**
2123	

DATE MAILED: 11/23/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	10/029,497	KRISHNAN, SIVARAM	
	Examiner	Art Unit	
	Russell L. Guill	2123	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE *3* MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *28 September 2005*.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☐ Claim(s) _____ is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-3,8,19 and 24-31* is/are rejected.

7)☒ Claim(s) *4,5,7 and 9* is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *21 December 2001* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☐ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

1. This action is in response to an Amendment filed September 28, 2005. Claims 1, 24, 30 and 31 have been amended. Claims 6 and 11 – 23 have been canceled. Claims 1 – 5, 7 – 10 and 24 – 31 remain pending. Claims 1 – 5, 7 – 10 and 24 – 31 have been examined. Claims 1 – 3, 8, 10 and 24 - 31 have been rejected. Claims 4 – 5, 7 and 9 are allowable.

Response to Remarks

2. Regarding claims 22, 24, 30 and 31 rejected under 35 USC § 112:

2.1. Applicant's amendments have corrected the issues, and the rejections are withdrawn.

3. Regarding claims 1 – 15 and 17 - 31 rejected under 35 USC § 101:

3.1. Applicant's amendments have corrected the issues, and the rejections are withdrawn.

4. On pages 7 – 8 of the amendment, the Applicant reviewed general differences between the recited prior art and the claim limitations:

4.1. The Applicant notes that the recited prior art refers to software-based methods. The Examiner respectfully notes that the specification refers to the invention as being implemented in hardware or software or firmware. Although the claim requires "changing the computer system dynamically," the Examiner respectfully notes that a broad reasonable interpretation of the phrase, which is consistent with the specification, includes changing the instructions during execution of instruction sequence, whether performed by hardware or software. The Examiner respectfully

notes that a broad reasonable interpretation of the phrase, "computer system", includes software.

4.2. The Examiner respectfully notes that Altman describes dynamic translation methods for instructions that occur during the actual emulation process, and utilizes dynamic profile data to dynamically change the emulation instructions during the execution (pages 40 – 41, section "Three Types of Translation"; and page 41, section "profiling", second paragraph, second sentence; and page 41, section "Dynamic Optimization").

4.3. The Applicant notes that claims 1 and 24 require "changing the computer system dynamically." The Examiner respectfully notes that a broad reasonable interpretation of the phrase, which is consistent with the specification, includes changing the instructions during execution of instruction sequence. This process is described in Altman, as described above. The Examiner respectfully notes that a broad reasonable interpretation of the phrase, "computer system", includes software.

5. Regarding claims 1 – 3, 6, 10 – 13, 17 - 18 and 22 rejected under 35 USC § 102:

5.1. Claims 6 and 11 – 23 have been canceled.

5.2. On pages 8 – 11 of the amendment, the Applicant reviews differences between the prior art of Altman and the invention as described in the specification, but does not link the differences to the claims, nor make any mention of differences between the prior art and a specific claim.

5.2.1. The Examiner respectfully replies that the Applicant's arguments do not comply with 37 CFR 1.111(c) because they do not clearly point out the patentable novelty which he or she thinks the claims present in view of the state of the art disclosed

by the references cited or the objections made because the arguments do not link the differences to the claims, nor make any mention of differences between the prior art and a specific claim.

5.2.2. The Examiner respectfully replies that in response to applicant's argument that the references fail to show certain features of applicant's invention, it is noted that the features upon which applicant relies (i.e., hardware implementation) are not recited in the rejected claim(s). Although the claims are interpreted in light of the specification, limitations from the specification are not read into the claims. See *In re Van Geuns*, 988 F.2d 1181, 26 USPQ2d 1057 (Fed. Cir. 1993).

5.2.3. The Examiner respectfully replies that the specification refers to the invention as being implemented in either hardware or software or firmware. The claims do explicitly claim a hardware implementation. The claims require "changing the computer system dynamically." The Examiner respectfully notes that a broad reasonable interpretation of the phrase, which is consistent with the specification, includes changing the instructions during execution of instruction sequence. Altman describes dynamic translation methods for instructions that occur during the actual emulation process, and utilizes dynamic profile data to dynamically change the emulation instructions during the execution (pages 40 – 41, section "Three Types of Translation"; and page 41, section "profiling", second paragraph, second sentence; and page 41, section "Dynamic Optimization"). The Examiner respectfully notes that a broad reasonable interpretation of the phrase, "computer system", includes software.

5.2.4. Accordingly, the rejections are maintained of claims 1 – 3 and 10 are maintained.

6. Regarding claim 4 rejected under 35 U.S.C. § 103:

6.1. Applicant's arguments have been fully considered and are persuasive. The rejection of claim 4 has been withdrawn.

7. Regarding claim 5 rejected under 35 U.S.C. § 103:

7.1. Applicant's arguments have been fully considered and are persuasive. The rejection of claim 5 has been withdrawn.

8. Regarding claim 7 rejected under 35 U.S.C. § 103:

8.1. Applicant's arguments have been fully considered and are persuasive. The rejection of claim 7 has been withdrawn.

9. Regarding claim 8 rejected under 35 U.S.C. § 103:

9.1. The Applicant argues that Wall's field is completely and distinctly different from the claimed invention. The Applicant summarizes Wall's reference.

9.1.1. The Examiner respectfully replies that Wall's field relative to the claimed invention is not applicable to whether the reference teaches the claim limitations.

9.1.2. Accordingly, the rejection is maintained.

10. Regarding claim 9 rejected under 35 U.S.C. § 103:

10.1. Applicant's arguments have been fully considered and are persuasive. The rejection of claim 9 has been withdrawn.

11. Regarding claim 24 rejected under 35 U.S.C. § 103:

11.1. The Applicant argues that Altman is a software approach.

11.1.1. The Examiner respectfully replies that in response to applicant's argument that the references fail to show certain features of applicant's invention, it is noted that the features upon which applicant relies (i.e., hardware implementation) are not recited in the rejected claim(s). Although the claims are interpreted in light of the specification, limitations from the specification are not read into the claims. See *In re Van Geuns*, 988 F.2d 1181, 26 USPQ2d 1057 (Fed. Cir. 1993).

11.2. Accordingly, the rejection is maintained.

12. Regarding claim 25 rejected under 35 U.S.C. § 103:

12.1. The Applicant argues that Altman and Conte could be used to improve branch prediction. However, it should be noted that Conte's method involves gathering of profile information during a prior run. So, this can be used in conjunction with Altman's art that deals with static translation, not any of the "Dynamic Translation."

12.1.1. The Examiner respectfully replies that the argument appears to not be directed to the claim.

12.2. The Applicant argues that Altman is a software approach.

12.2.1. The Examiner respectfully replies that in response to applicant's argument that the references fail to show certain features of applicant's invention, it is noted that the features upon which applicant relies (i.e., not software implementation) are not recited in the rejected claim(s). Although the claims are interpreted in light of the specification, limitations from the specification are not

read into the claims. See *In re Van Geuns*, 988 F.2d 1181, 26 USPQ2d 1057 (Fed. Cir. 1993).

12.3. Accordingly, the rejection is maintained.

13. Regarding claim 26 and 27 rejected under 35 U.S.C. § 103:

13.1. The Applicant argues that Altman is a software approach.

13.1.1. The Examiner respectfully replies that in response to applicant's argument that the references fail to show certain features of applicant's invention, it is noted that the features upon which applicant relies (i.e., not software implementation) are not recited in the rejected claim(s). Although the claims are interpreted in light of the specification, limitations from the specification are not read into the claims. See *In re Van Geuns*, 988 F.2d 1181, 26 USPQ2d 1057 (Fed. Cir. 1993).

13.2. Accordingly, the rejections are maintained.

14. Regarding claims 28 and 29 rejected under 35 U.S.C. § 103:

14.1. The Applicant argues that because information such as lifetimes of registers that is available at link-time is not available at run-time, so Wall is not applicable. The Applicant argues that determining an algorithm to cycle through registers is not possible unless the hardware platform is fixed.

14.1.1. The Examiner respectfully replies that in response to applicant's argument that the references fail to show certain features of applicant's invention, it is noted that the features upon which applicant relies (i.e., not software implementation) are not recited in the rejected claim(s). Although the claims are

interpreted in light of the specification, limitations from the specification are not read into the claims. See *In re Van Geuns*, 988 F.2d 1181, 26 USPQ2d 1057 (Fed. Cir. 1993).

14.2. Accordingly, the rejections are maintained.

15. Regarding claim 30 rejected under 35 U.S.C. § 103:

15.1. Applicant's arguments have been fully considered and are persuasive. The rejection of claim 30 has been withdrawn.

16. Regarding claim 31 rejected under 35 U.S.C. § 103:

16.1. The Applicant argues that the claimed embodiment is superior to the approach of Conte with the ability to change parameters based on current program execution.

16.1.1. The Examiner respectfully replies that the claim does not recite the ability to change parameters based on current program execution.

16.2. Accordingly, the rejection is maintained.

Claim Rejections - 35 USC § 103

17. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter

pertains. Patentability shall not be negatived by the manner in which the invention was made.

18. Claims 1 – 3 and 10 are rejected under 35 U.S.C. 103(a) as being unpatentable over Altman (Altman, Erik R.; Kaeli, David; Sheffer, Yaron; "Welcome to the opportunities of Binary Translation", March 2000, IEEE Computer), in view of common knowledge in the art.

18.1. Regarding claim 1, Altman appears to teach:

18.1.1. a method performed by a computer system ***(page 40 – 41, section labeled "Three Types of Translation"; and page 44, left-side column, paragraph that starts with "Translated applications . . .")***.

18.1.2. Obtaining an emulated sequence of instructions derived from an original sequence of instructions ***(page 40 – 41, section labeled "Three Types of Translation")***.

18.1.3. Producing first dynamic execution information in response to executing the emulated sequence of instructions ***(page 41, section labeled "Profiling", first paragraph)***; and

18.1.4. Changing the computer system dynamically for producing different dynamic execution information in response to said first dynamic execution information ***(page 41, section labeled "Profiling", second paragraph, second sentence; and page 41, section labeled "Dynamic optimization")***.

18.2. Altman does not specifically teach:

18.2.1. initiating execution of the emulated sequence of instructions.

18.3. Official Notice is taken that it was old and well known in the art at the time of invention to execute a sequence of emulated instructions. The motivation would have been the nature of the problem, which is to perform a sequence of instructions to achieve a result.

18.4. Therefore, as discussed above, it would have been obvious to the ordinary artisan at the time of invention to use common knowledge in the art with the art of Altman to produce the claimed invention.

18.5. Regarding claim 2, Altman appears to teach:

18.5.1. modifying at least parameters of instructions of the emulated sequence of instructions ***(page 41, section labeled "Dynamic Optimization", second paragraph, first bullet item that starts with "ISA remapping")***.

18.5.2. Regarding ***(page 41, section labeled "Dynamic Optimization", second paragraph, first bullet item that starts with "ISA remapping")***; the registers are parameters of instructions as defined in the specification on page 9, lines 5 – 15.

18.6. Regarding claim 3, Altman appears to teach:

18.6.1. modifying at least register fields of instructions of the emulated sequence of instructions ***(page 41, section labeled "Dynamic Optimization", second paragraph, first bullet item that starts with "ISA remapping")***.

18.7. Regarding claim 10, Altman appears to teach that changing generates a modified emulated sequence of instructions by modifying at least some instructions of the emulated sequence of instructions in response to at least some of the dynamic

execution information ***(page 41, section labeled "Dynamic Optimization", second paragraph, first bullet item and second bullet item)***.

18.7.1. Regarding ***(page 41, section labeled "Dynamic Optimization", second paragraph, first bullet item and second bullet item)***; both the "ISA remapping" and "basic block reordering", modify instructions.

19. Claims 8 is rejected under 35 U.S.C. 103(a) as being unpatentable over Altman (Altman, Erik R.; Kaeli, David; Sheffer, Yaron; "Welcome to the opportunities of Binary Translation", March 2000, IEEE Computer) in view of Wall (Wall, David W.; "Global Register Allocation at Link Time", October 28, 1986, www.hpl.hp.com/techreports/Compaq-DEEC/WRL-86-3.html).

19.1. Claim 8 is a dependent claim of claim 1, and thereby inherits all of the rejected limitations of claim 1.

19.2. The art of Altman is directed toward translating machine instructions for one computer into machine instructions to run on a second computer, including profiling and dynamic optimization ***(pages 40 - 41)***.

19.3. The art of Wall is directed to optimizing register allocation, including using profile information to perform optimization ***(page 1, Abstract)***.

19.4. Regarding claim 8, Altman does not specifically teach that the step of producing produces a history of register allocation information.

19.5. Regarding claim 8, Altman does not specifically teach that the step of changing changes register allocation.

19.6. Regarding claim 8, Wall appears to teach producing a history of register allocation information ***(page 1, Abstract, paragraph 3; and page 12, section 2.4.4. Profiling)***.

19.7. Regarding claim 8, Wall appears to teach changing register allocation ***(page 1, Abstract, paragraph 3; and page 12, section 2.4.4. Profiling)***.

19.8. The art of Wall and the art of Altman are analogous art because they both include the problem of profiling a program execution and using the profile information to optimize the program.

19.9. The motivation to use the art of Wall with the art of Altman would have been obvious because of the benefit recited in Wall that benchmark program speedup was 10 to 25 percent ***(page 1, Abstract, paragraph 3)***.

19.10. Therefore, as discussed above, it would have been obvious to the ordinary artisan at the time of invention to use the art of Wall with the art of Altman to produce the claimed invention.

20. Claim 24 is rejected under 35 U.S.C. 103(a) as being unpatentable over Altman (Altman, Erik R.; Kaeli, David; Sheffer, Yaron; "Welcome to the opportunities of Binary Translation", March 2000, IEEE Computer) in view of common knowledge in the art.

20.1. Altman appears to teach a storage means storing an emulated sequence of instructions produced from an original sequence of instructions ***(pages 40 – 41, section labeled "Three Types of Translation")***.

20.1.1. Regarding ***(pages 40 – 41, section labeled "Three Types of Translation")***; it would have been obvious that storage means are used to store the emulated sequence of instructions (e.g. RAM).

20.2. Altman appears to teach a means for producing dynamic execution information in response to execution of the emulated sequence of instructions ***(page 41, section labeled "Profiling")***.

20.3. Altman appears to teach a means for responding to the dynamic execution information and for changing the computer system dynamically so that at least some dynamic execution information obtained on subsequent execution of the emulated sequence of instructions would be changed ***(page 41, section labeled "Dynamic optimization"; and page 41, section labeled "Profiling", second paragraph, second sentence)***.

20.4. Altman does not specifically teach a processing means for executing the emulated sequence of instructions.

20.5. Official Notice is taken that it was old and extremely well known in the art at the time of invention to have a processing means for executing an emulated sequence of instructions (e.g. a processor). The motivation would have been the nature of the problem, which was to execute a sequence of emulated instructions.

21. Claim 25 is rejected under 35 U.S.C. 103(a) as being unpatentable over Altman and common knowledge in the art, as applied to claim 24 above, in view of Conte (Conte, Thomas M.; Patel, Burzin A.; Cox, J. Stan; "Using Branch Handling Hardware to Support Profile-Driven Optimization", 1994, Proceedings of the 1994 27th annual international symposium on microarchitecture).

21.1. The art of Altman is directed toward translating machine instructions for one computer into machine instructions to run on a second computer, including profiling and dynamic optimization ***(pages 40 - 41)***.

21.2. The art of Conte is directed to using branch handling hardware to support profile-driven optimization ***(page 1, Title)***.

21.3. Altman does not specifically teach maintaining a record of branch addresses in the emulated sequence of instructions historically correlated to whether branches were taken during execution of the emulated sequence of instructions.

21.4. Altman does not specifically teach means for changing a likelihood condition code of the branch prediction information for at least one of the branches.

21.5. Conte appears to teach means for maintaining a record of branch addresses in the emulated sequence of instructions historically correlated to whether branches were taken during execution of the emulated sequence of instructions ***(page 2, section 2 "Branch Prediction and Profiling"; and figure 1; and figure 2)***.

21.6. Conte appears to teach means for changing a likelihood condition code of the branch prediction information for at least one of the branches ***(page 2, section 2 "Branch Prediction and Profiling"; and figure 1; and figure 2)***.

21.7. The art of Conte and the art of Altman are analogous art because they both contain the problem of profiling and optimization.

21.8. The motivation to use the art of Conte with the art of Altman would have been obvious given the benefit recited in Conte that using the specified branch prediction method produces a dramatic effect in achieving 96% accuracy in branch prediction ***(page 2, section 2.1 Contemporary branch handling mechanisms, second paragraph)***;

21.9. Therefore, as discussed above, it would have been obvious to the ordinary artisan at the time of invention to use the art of Conte with the art of Altman to produce the claimed invention.

22. Claims 26 and 27 are rejected under 35 U.S.C. 103(a) as being unpatentable over Altman and common knowledge in the art, as applied to claim 24 above.

22.1. Regarding claim 26, Altman appears to teach modifying at least parameters of instructions of the emulated sequence of instructions ***(page 41, section labeled "Dynamic Optimization", second paragraph, first bullet item that starts with "ISA remapping")***.

22.1.1. Regarding ***(page 41, section labeled "Dynamic Optimization", second paragraph, first bullet item that starts with "ISA remapping")***; the registers are parameters of instructions as defined in the specification on page 9, lines 5 – 15.

22.2. Regarding claim 27, Altman appears to teach modifying at least register fields of instructions of the emulated sequence of instructions ***(page 41, section labeled "Dynamic Optimization", second paragraph, first bullet item that starts with "ISA remapping")***.

23. Claims 28 and 29 are rejected under 35 U.S.C. 103(a) as being unpatentable over Altman and common knowledge in the art, as applied to claim 24 above, in view of Wall (Wall, David W.; "Global Register Allocation at Link Time", October 28, 1986, www.hpl.hp.com/techreports/Compaq-DEEC/WRL-86-3.html).

23.1. The art of Altman is directed toward translating machine instructions for one computer into machine instructions to run on a second computer, including profiling and dynamic optimization ***(pages 40 - 41)***.

23.2. The art of Wall is directed to optimizing register allocation, including using profile information to perform optimization ***(page 1, Abstract)***.

23.3. Regarding claim 28, Altman does not specifically teach cycling allocation of registers in a pool of registers as some of successively identified registers in the emulated sequence of instructions.

23.4. Regarding claim 29, Altman does not specifically teach producing a history of temporary register allocation information.

23.5. Regarding claim 29, Altman does not specifically teach changing register parameters of the emulated sequence of instructions.

23.6. Regarding claim 28, Wall appears to teach cycling allocation of registers in a pool of registers as some of successively identified registers in the emulated sequence of instructions ***(page 4, code example below paragraph 2)***.

23.7. Regarding claim 29, Wall appears to teach producing a history of register allocation information ***(page 1, Abstract, paragraph 3; and page 12, section 2.4.4. Profiling)***.

23.8. Regarding claim 29, Wall appears to teach changing register parameters of the emulated sequence of instructions ***(page 1, Abstract, paragraph 3; and page 12, section 2.4.4. Profiling)***.

23.9. The art of Wall and the art of Altman are analogous art because they both include the problem of profiling a program execution and using the profile information to optimize the program.

23.10. The motivation to use the art of Wall with the art of Altman would have been obvious because of the benefit recited in Wall that benchmark program speedup was 10 to 25 percent ***(page 1, Abstract, paragraph 3)***.

23.11. Therefore, as discussed above, it would have been obvious to the ordinary artisan at the time of invention to use the art of Wall with the art of Altman to produce the claimed invention.

24. Claim 30 is rejected under 35 U.S.C. 103(a) as being unpatentable over Altman and common knowledge in the art, as applied to claim 26 above, in view of Wall (Wall, David W.; "Global Register Allocation at Link Time", October 28, 1986, www.hpl.hp.com/techreports/Compaq-DEEC/WRL-86-3.html).

24.1. The art of Altman is directed toward translating machine instructions for one computer into machine instructions to run on a second computer, including profiling and dynamic optimization ***(pages 40 - 41)***.

24.2. The art of Wall is directed to optimizing register allocation, including using profile information to perform optimization ***(page 1, Abstract)***.

24.3. Altman appears to teach an emulation code generator for generating the emulated sequence of instructions that is executable with a first instruction set from the original sequence of instructions that is executable with a different instruction set ***(page 40, title; and abstract directly beneath the title; and left-side column, paragraph 3, definition of "binary translation")***.

24.4. Altman appears to teach modifying the emulated sequence of instructions in response to at least the historical register usage information ***(page 41, section "Dynamic optimization")***.

24.5. Altman does not specifically teach generating historical register usage information regarding register status during execution of the emulation sequence of instructions.

24.6. Wall appears to teach generating historical register usage information regarding register status during execution of the emulation sequence of instructions ***(page 1, Abstract, paragraph 3; and page 12, section 2.4.4. Profiling)***.

24.7. The art of Wall and the art of Altman are analogous art because they both include the problem of profiling a program execution and using the profile information to optimize the program.

24.8. The motivation to use the art of Wall with the art of Altman would have been obvious because of the benefit recited in Wall that benchmark program speedup was 10 to 25 percent ***(page 1, Abstract, paragraph 3)***.

24.9. Therefore, as discussed above, it would have been obvious to the ordinary artisan at the time of invention to use the art of Wall with the art of Altman to produce the claimed invention.

25. Claim 31 is rejected under 35 U.S.C. 103(a) as being unpatentable over Altman and common knowledge in the art, in view of Conte (Conte, Thomas M.; Patel, Burzin A.; Cox, J. Stan; "Using Branch Handling Hardware to Support Profile-Driven Optimization", 1994, Proceedings of the 1994 27th annual international symposium on microarchitecture).

25.1. The art of Altman is directed toward translating machine instructions for one computer into machine instructions to run on a second computer, including profiling and dynamic optimization ***(pages 40 - 41)***.

25.2. The art of Conte is directed to using branch handling hardware to support profile-driven optimization ***(page 1, Title)***.

25.3. Altman appears to teach an emulation code generator for generating the emulated sequence of instructions that is executable with a first instruction set from the original sequence of instructions that is executable with a different second instruction set ***(page 40, title; and abstract directly beneath the title; and left-side column, paragraph 3, definition of "binary translation")***.

25.4. Altman does not specifically teach generating historical branch prediction dynamic execution information regarding likelihood of branches taken during execution of the emulation sequence of instructions.

25.5. Altman does not specifically teach generating a branch prediction likelihood code for a group of branches that may be different from any branch prediction of the members of the group and is dependent upon a combined effect of the branch predictions of the members of the group.

25.6. Conte appears to teach generating historical branch prediction dynamic execution information regarding likelihood of branches taken during execution of the emulation sequence of instructions ***(pages 3 – 4, section 3 Using Branch Prediction Hardware for Profiling; and page 2, section 2 Branch Prediction and Profiling)***.

25.7. Conte appears to teach generating a branch prediction likelihood code for a group of branches that may be different from any branch prediction of the members of the

group and is dependent upon a combined effect of the branch predictions of the members of the group ***(page 2, section 2.1 Contemporary branch handling mechanisms, second paragraph; and figure 2)***.

25.7.1. Regarding ***(page 2, section 2.1 Contemporary branch handling mechanisms, second paragraph; and figure 2)***; it would have been obvious to generate a branch prediction likelihood code for a group of branches that may be different from any branch prediction of the members of the group and is dependent upon a combined effect of the branch predictions of the members of the group.

25.8. The art of Conte and the art of Altman are analogous art because they both contain the problem of profiling and optimization.

25.9. The motivation to use the art of Conte with the art of Altman would have been obvious given the benefit recited in Conte that using the specified branch prediction method produces a dramatic effect in achieving 96% accuracy in branch prediction ***(page 2, section 2.1 Contemporary branch handling mechanisms, second paragraph)***;

25.10. Therefore, as discussed above, it would have been obvious to the ordinary artisan at the time of invention to use the art of Conte with the art of Altman to produce the claimed invention.

Allowable Subject Matter

26. Claims 4 – 5, 7 and 9 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

Conclusion

27. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

28. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Russell L. Guill whose telephone number is 571-272-7955. The examiner can normally be reached on Monday – Friday 10:00 AM – 6:30 PM.

29. If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Leo Picard can be reached on 571-272-3749. The fax phone number for the

organization where this application or proceeding is assigned is 571-273-8300. Any inquiry of a general nature or relating to the status of this application should be directed to the TC2100 Group Receptionist: 571-272-2100.

30. Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

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